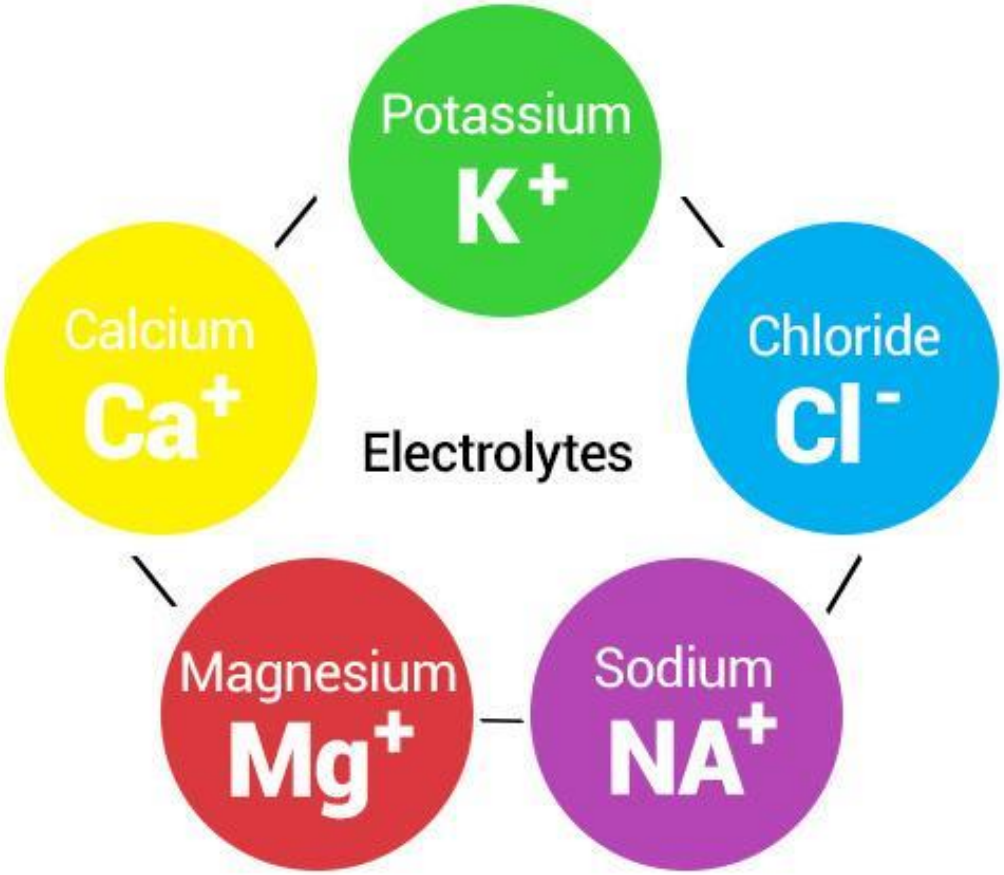
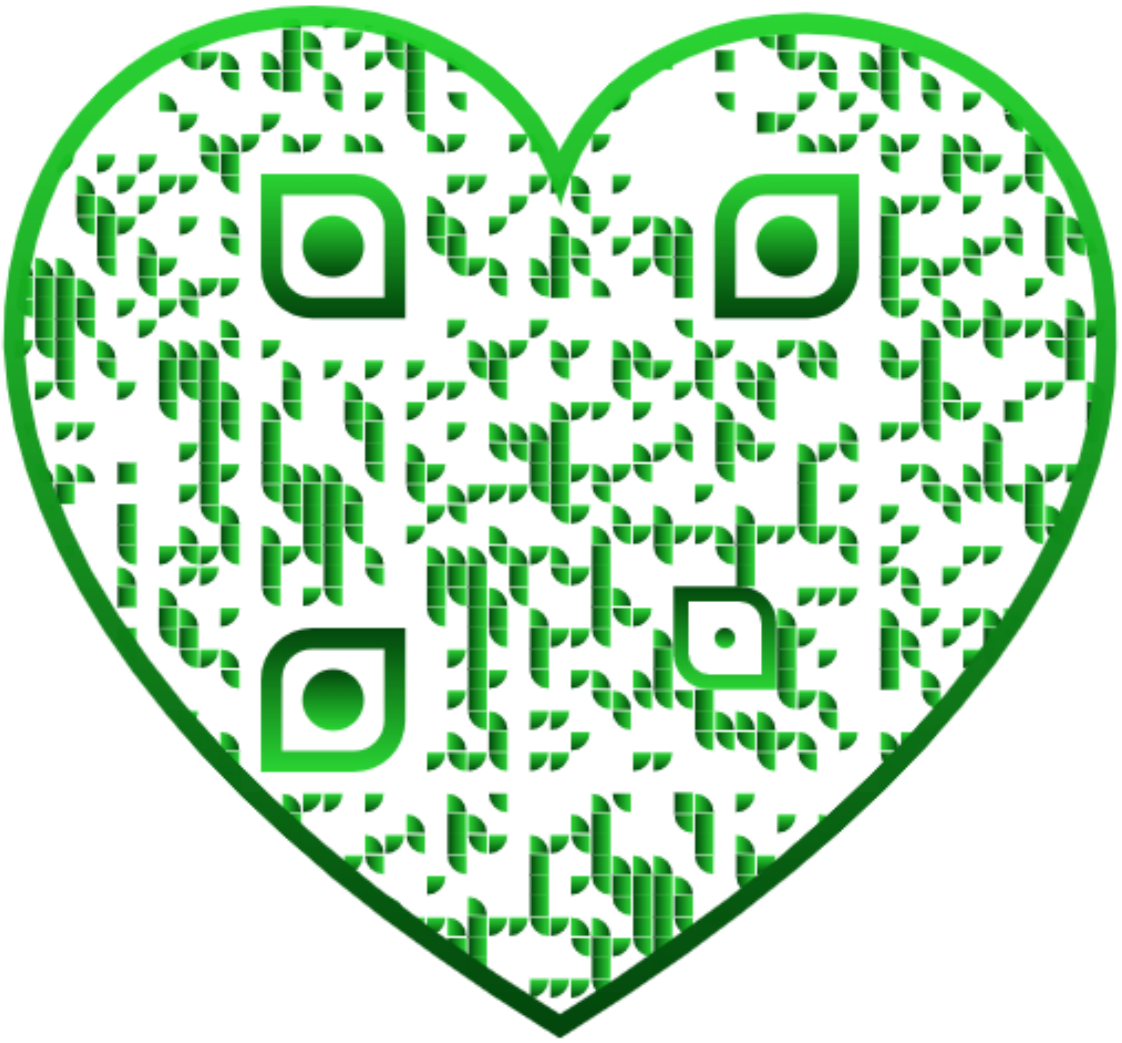
Serum electrolyte panel





Electrolyte

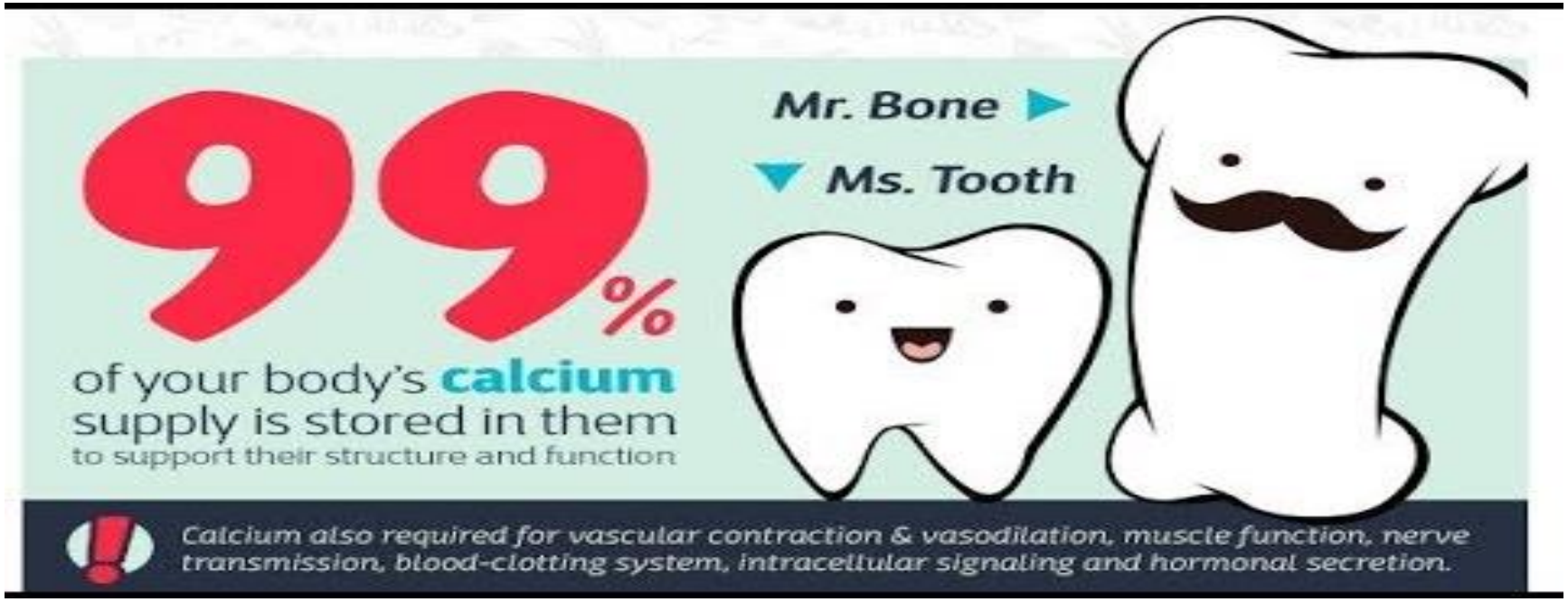
Cation

- (Positively charged ins) of human fluids
- A positively charged ion or electrolyte; Sodium, Potassium, Magnesium (ECF) Sodium, Potassium, Magnesium (ICF)

Anion

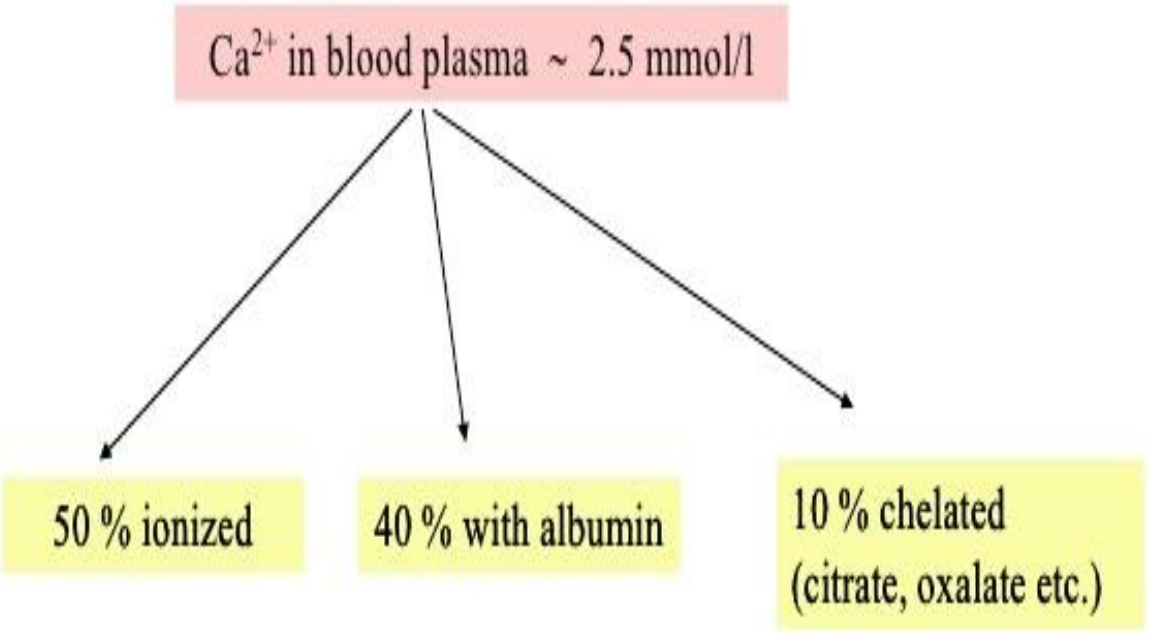
- A negatively charged ion or electrolyte; chloride, bicarbonate, phosphate, sulfate
- Protein and organic acids (ECF). Chloride, bicarbonate, Phosphate and protein (ICF)

Calcium

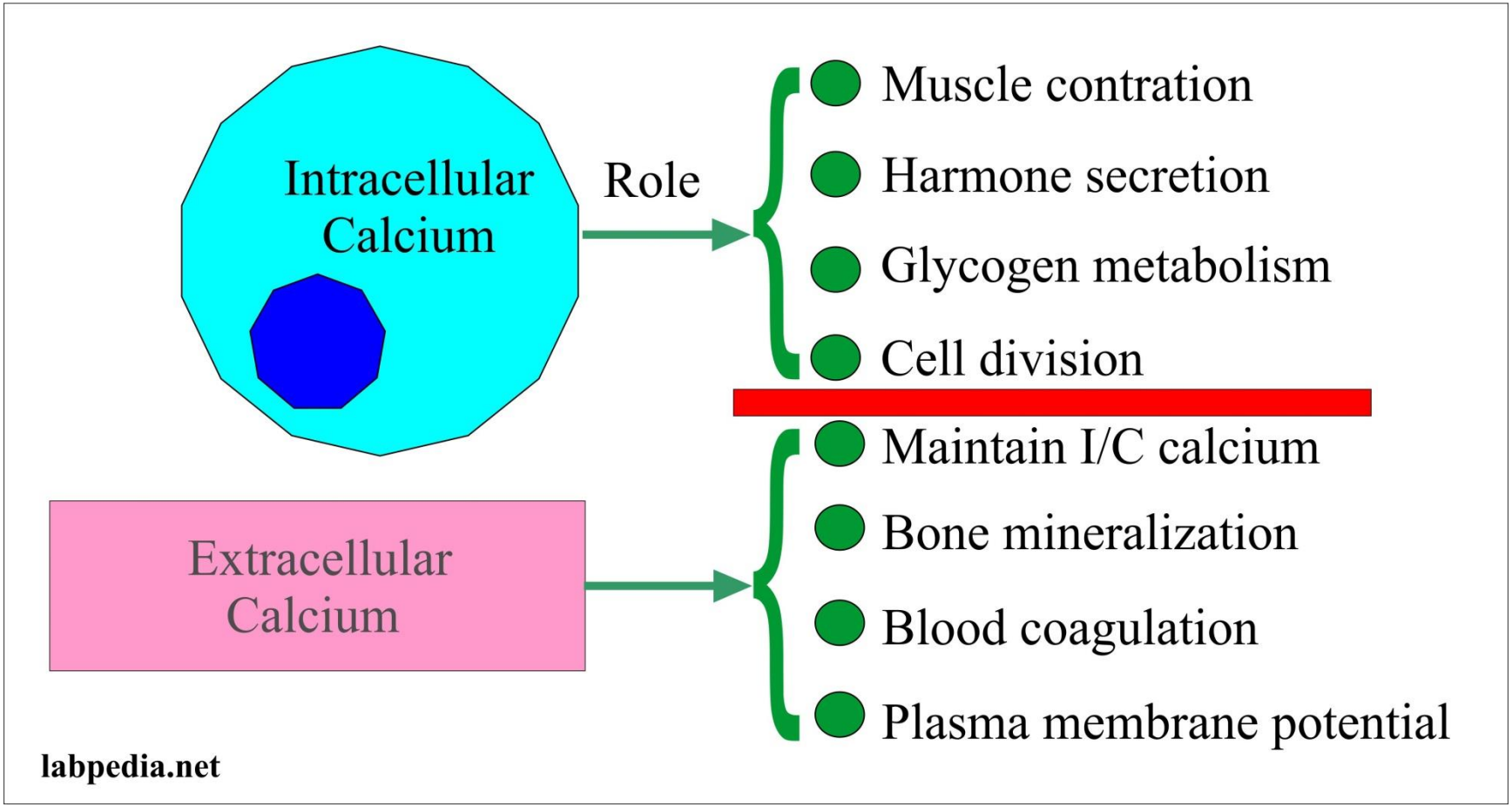

99%
of your body's calcium supply is stored in them
to support their structure and function
Mr. Bone
Ms. Tooth
Calcium also required for vascular contraction & vasodilation, muscle function, nerve transmission, blood-clotting system, intracellular signaling and hormonal secretion.

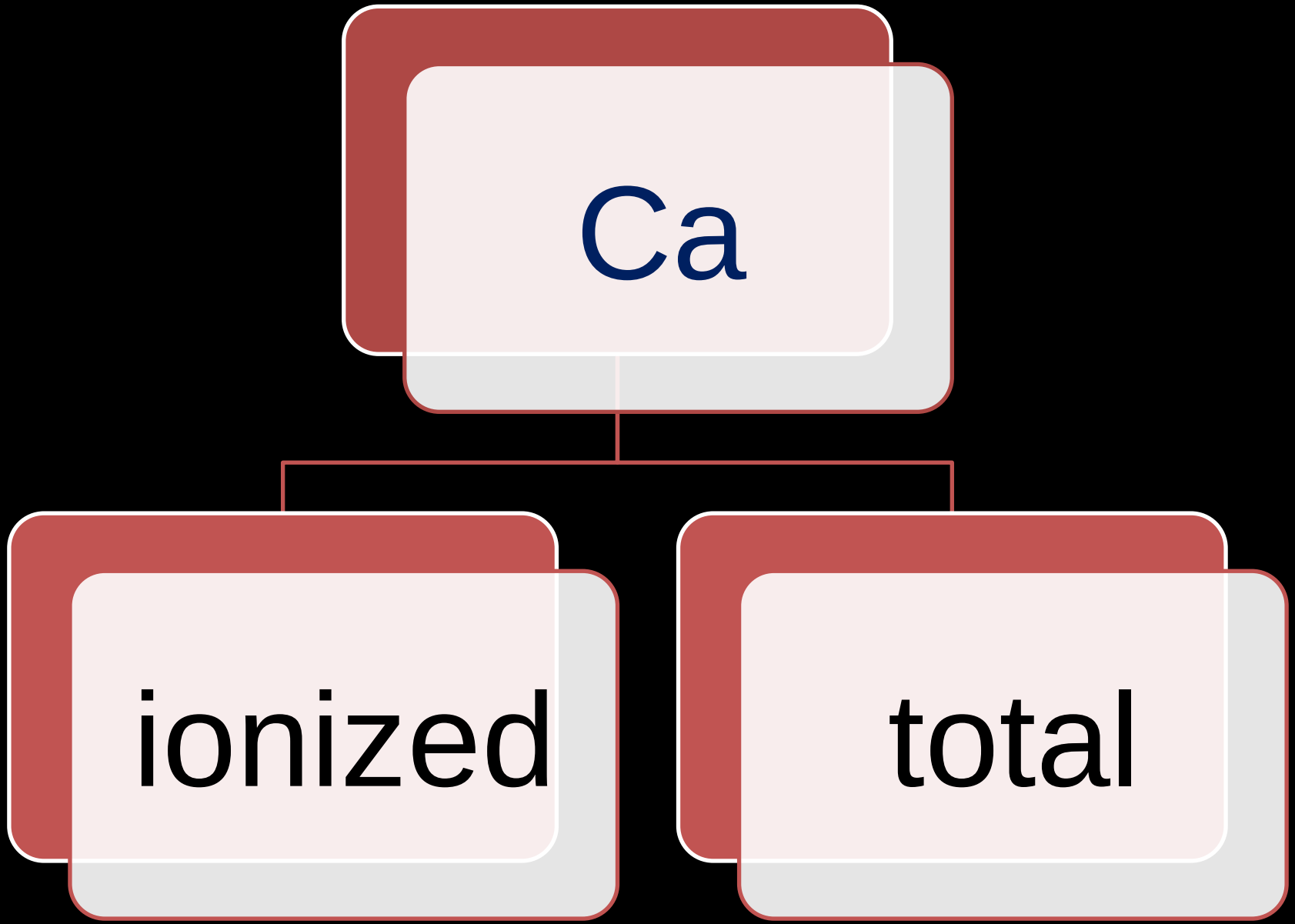
Calcium in the body

bones, teeth	soft tissues	ECF
99 %	0.9 %	0.1 %



Calcium


Intracellular Calcium
Role
Muscle contration
Harmone secretion
Glycogen metabolism
Cell division
Maintain I/C calcium
Extracellular Calcium
Bone mineralization
Blood coagulation
Plasma membrane potential
labpedia.net


Ca
ionized
total

- **Specimens**
- Serum , plasma with heparin , urine

- **Precaution**
- Without venous stasis
- No EDTA plasma (Why???)
- Patient no receive EDTA therapy

- **Principle, Procedure and result as company kit**

-:Formula:-

- Thus ,calcium level should be corrected in patients with low serum albumin levels ,using the formula :
- Corrected calcium(mg/dL)= measured total Ca(mg/dL)+0.8(4.0-serum albumin <g/dL>),
- Where 4 respresents the average albumin level.

Calcium correction

- Corrected ca^{2+} (mmol/l)= (Ca) + 0.02 (40 - albumin)
- Corrected calcium (mg/dL) = Ca (mg/dL) + 0.8 (4.0 - serum albumin [g/dL]),

Interpretation of result for serum calcium

Hypercalcemia :

- Hyperparathyroidism
- Excessive intake of ca
- Childhood fracture
- Milk alkali syndrome
- Thyrotoxicosis
- Leukemia

Effect of increase serum calcium:

- Renal stone
- Calcification in different tissue

Hypocalcemia :

- Hypoparathyrodism
- Pseudo hypoparathyrodism
- Vitamin d deficiency
- Gastrointestinal disease
- Chronic renal failure and nephritis
- Hypoalbuminemia

Effect of Decrease serum

- Acut :- teatny
- Chronic

Children :- rickets

Adult :- osteomalasia

Thank
you!!

Electrolyte

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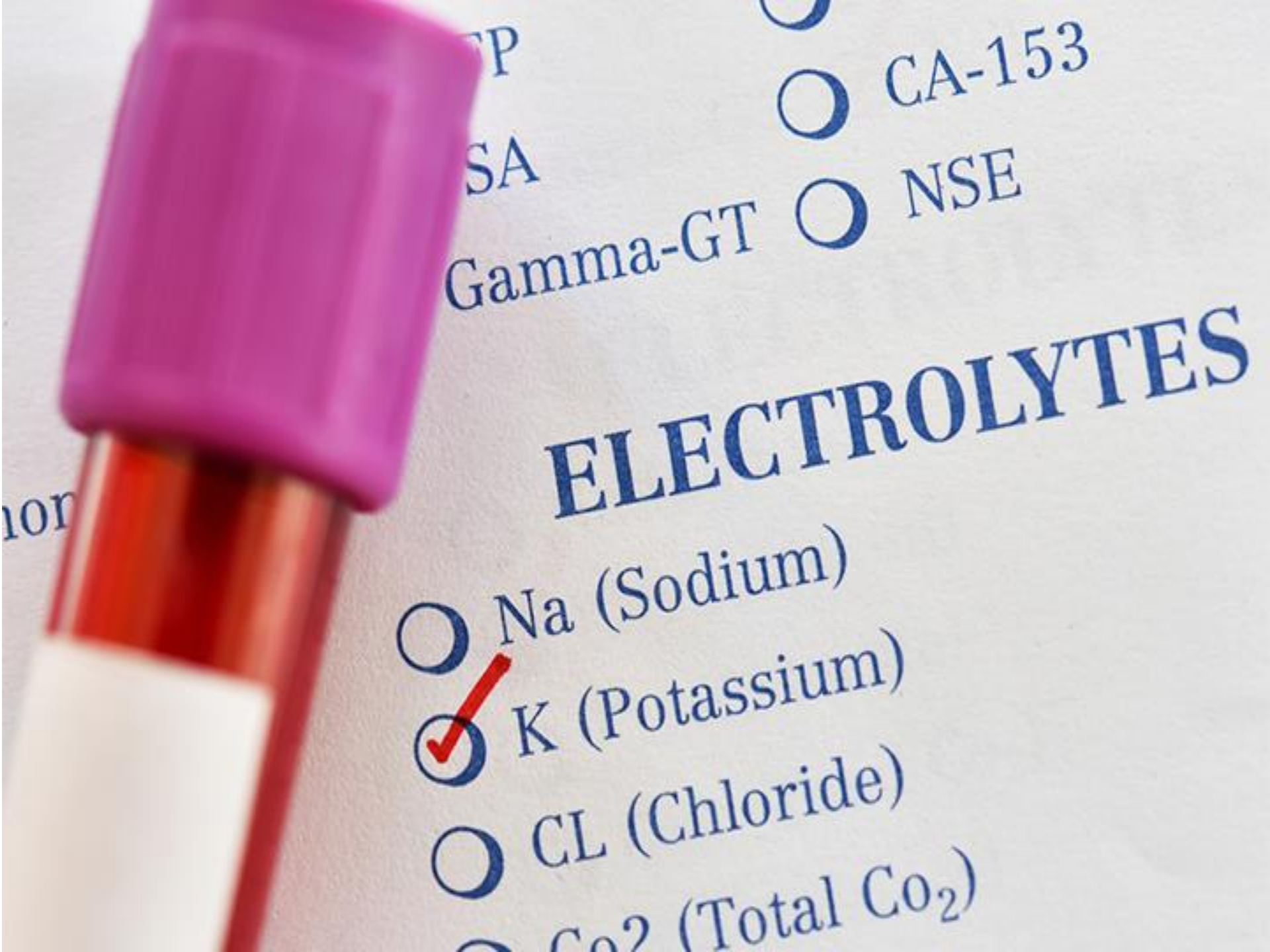
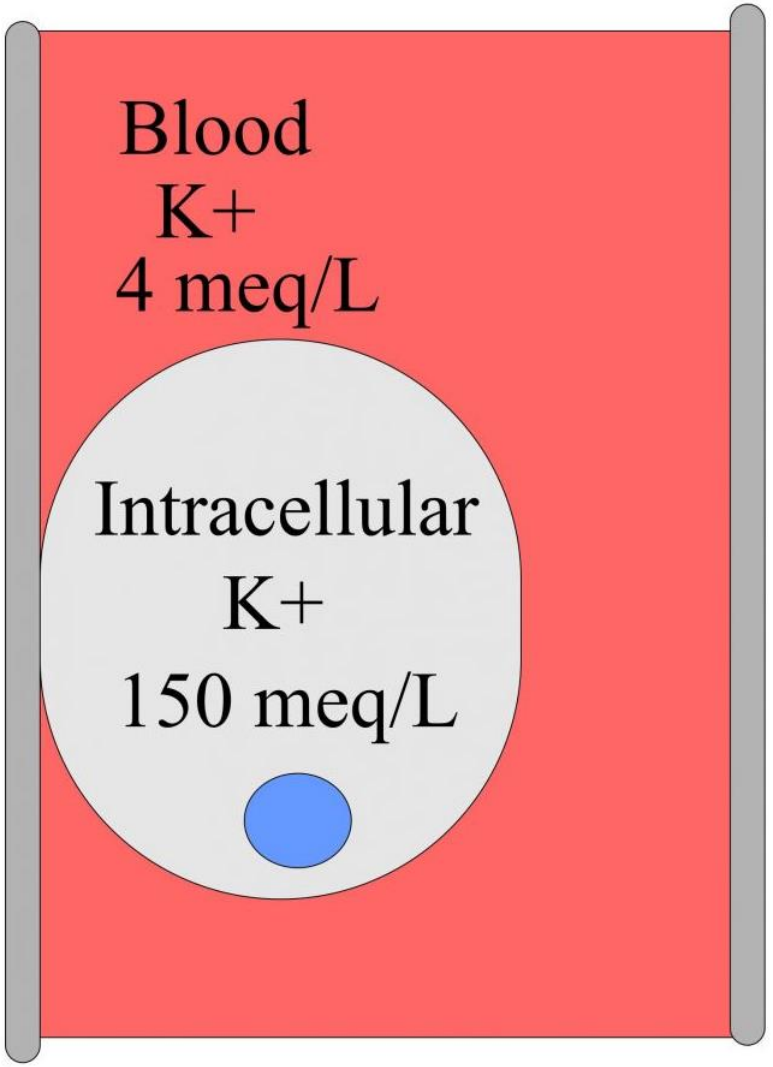

CA-153
NSE
Gamma-GT
ELECTROLYTES
Na (Sodium)
K (Potassium)
CL (Chloride)

Potassium

Potassium is the major intracellular cation.

20X greater concentration in the cell vs. outside.

2% of the bodies potassium circulates within the plasma.



Regulation of potassium

- Kidneys regulate the potassium balance.
- Reabsorption of potassium occurs in the proximal tubules
- Under influenced of aldosterone- potassium secreted in the urine in exchange for sodium.

- **Specimens**
- Serum , plasma with heparin

- **Principle, Procedure and result as company kit**

Hyperkalemia :increase K level more than 5 mEq/l

Causes of Increased Serum K+

MACHINE:

M = Medications – Certain diuretics

A = Acidosis - Metabolic and respiratory

C = Cellular destruction - Burns, traumatic injury

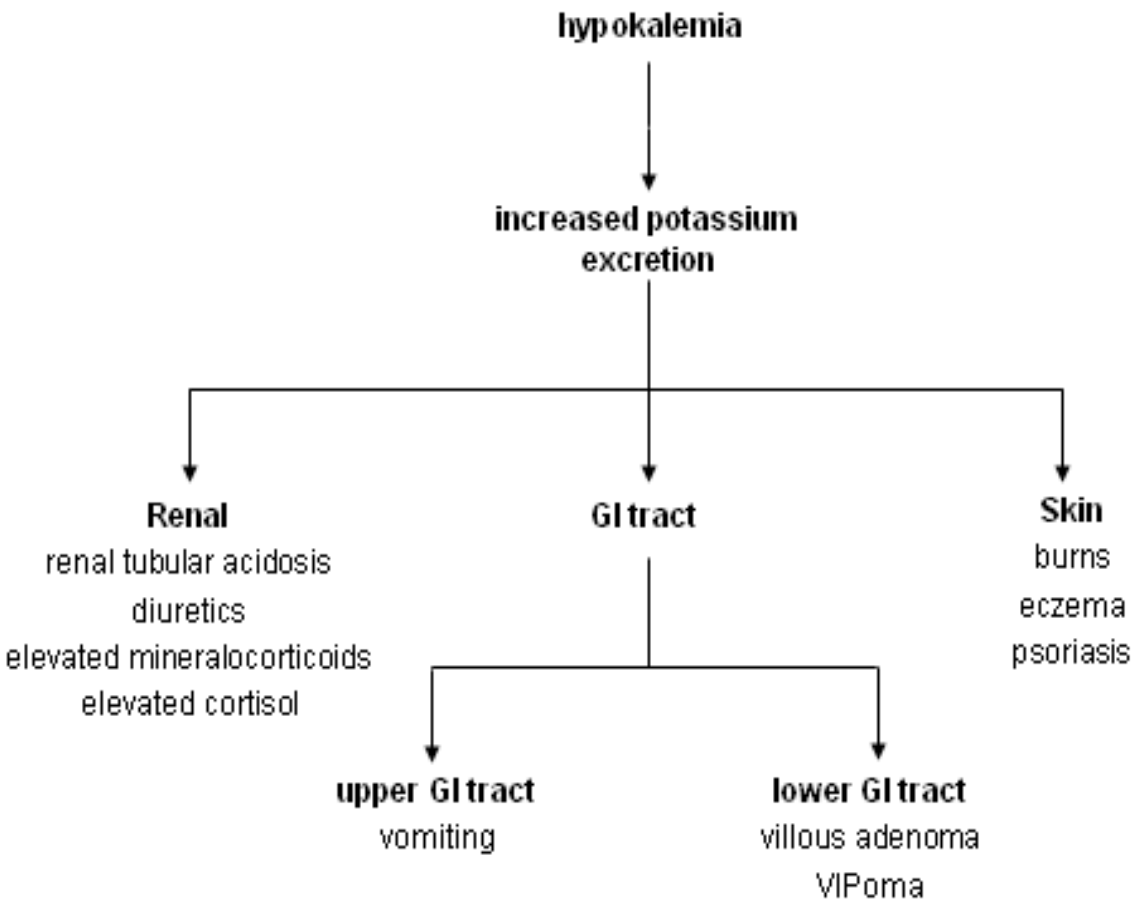
H =Hypo aldosteronism, Hemolysis

I = Intake - Excesssive

N = Nephrons, renal failure

E = Excretion - Impaired

Hypokalemia : decrease in K level less than 3mEq/l



Thank
you!!